

REMARKS

Claims 1-20 are pending in the present invention. Claim 1 has been amended. No new matter has been added by the amendment.

Claim objections:

Claims 1-20 were objected to because of informalities. The word "radically" in line 15 of claim 1 has been corrected to recite "radially", as suggested by the Examiner. Thus, withdrawal of the claim objections respectfully requested.

Claim Rejections under 35 U.S.C. 102:

Claims 1, 3-5, 14, 17-18 and 20 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,338,363 to Kawata et al (hereinafter "Kawata") for the reasons stated on pages 2-4 of the Office Action.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). However, Kawata does not disclose or teach all the features of claim 1.

Particularly, Kawata does not disclose or teach the features: a second connection line in communication with the shower head plate for supplying a second reaction gas and the inert gas and a plurality of nozzles which is in communication with a passage radially formed from the second connection line and extend toward the inner side surface of the reactor block to spray the second reaction gas and the inert gas toward edges of the wafer, whereby the first and second reaction gases are applied on the wafer without mixing each other, as claimed in claim 1.

Kawata focuses on preventing the deposition of a reaction byproduct on the peripheries of reaction gas introduction holes. In order to do that, Kawata includes a first inert gas passage (28 in Fig. 10) for injecting a first inert gas from an inert gas injection hole (25) into an exhaust

passage (13) to discharge the reaction by product (which is produced by the thermochemical reaction of the reaction gas (21) supplied from reaction gas supply units (19a and 19b)) from the exhaust passage (13) (See, Abstract). Thus, the first inert gas passage (28) is not the second connection line for supplying the second reaction gas, as cited in claim 1. In Kawata, the reaction gases are supplied by the reaction gas supply units (19a and 19b). However, any of the reaction gas supply units is not the second connection line of claim 1, because any of the reaction gas supply units is not communicated with the plurality of nozzles and the reaction gases supplied from the reaction gas supply units are mixed to each other before sprayed to a wafer. Thus, Kawata does not disclose or teaches the features of the second connection line and the plurality of nozzles, as cited in claim 1.

However, the Examiner further states that the type of gas supplied in the apparatus is not of primary importance in an apparatus claims and that a claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus. Applicant respectfully submits that it is important for the apparatus of claim 1 to include first and second connection lines separately, because the apparatus of claim 1 concerns independently supplying different reaction gases into a wafer without mixing each other. Further, the first and second connection lines are communicated with the spray holes and the nozzles respectively and they are not communicated to each other, thereby independently spraying the first and second reaction gases to the wafer. Thus, the recitations for the first and second connection lines are not the recitations with respect to the manner in which the apparatus of claim 1 is intended to be employed. Therefore, the recitations of claim 1 differentiate the apparatus of claim from the apparatus of Kawata.

Thus, Kawata does not disclose or teach all the features of claim 1. Accordingly, Kawata does not anticipate or render obvious claim 1. Claims 3-5, 14, 17-18 and 20 depend

from claim 1, thus are believed to be allowable due to their dependency on claim 1. Therefore, the reconsideration and withdrawal of the claim rejection under 35 U.S.C. 102(b) are respectfully requested.

Claim Rejections under 35 U.S.C. 103:

Claims 2 and 19

Claims 2 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata in view of U.S. Patent No. 5, 439,524 to Cain et al (hereinafter "Cain").

As discussed above, Kawata fails to teach or suggest the features: a second connection line in communication with the shower head plate for supplying a second reaction gas and the inert gas and a plurality of nozzles which is in communication with a passage radially formed from the second connection line and extend toward the inner side surface of the reactor block to spray the second reaction gas and the inert gas toward edges of the wafer, whereby the first and second reaction gases are applied on the wafer without mixing each other, as claimed in claim 1.

Cain discloses a plasma processing apparatus in which a fluid distribution head having a non-planar dispersion plate is provided. The fluid distribution head of Cain includes one fluid inlet pipe (44 in Fig. 2 of the Cain) and no nozzle. Thus, Cain does not cure the deficiency of Kawata. Accordingly, the combination of Kawata and Cain does not render obvious claim 1. Claims 2 and 19 depend from claim 1, and thus are believed to be allowable for at least the reasons given for claim 1.

Claim 6

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata in view of Japanese Patent No. 02-015171 to Okazaki et al. (hereinafter "Okazaki") for the reasons stated on page 5 of the Office Action.

The apparatus of Okazaki includes only one reaction gas introducing port (6), and does

not include the nozzles communicated with a second connection line. Thus, Okazaki does not cure the deficiency of Kawata.

Further, Okazaki does not teach or suggest the features: a second mixing portion between the second connection line and the shower head plate for mixing the second reaction gas and the inert gas supplied from the second connection line and diffusing the mixture to the nozzles through the passage, the second mixing portion having an auxiliary diffusion plate in which holes are formed, as claimed in claim 6. In claim 6, the second mixing portion is disposed between the second connection line and the shower head plate and mixes the second reaction gas and the inert gas. Although Okazaki discloses mixing a rare gas and gaseous monomer, Okazaki does not teach or suggest the structure feature disposed between the reaction gas introducing portion (6) and a shower head plate and having an auxiliary diffusion plate. Thus, Okazaki does not teach or suggest the second mixing portion. Accordingly, the combination of Kawata and Okazaki does not render obvious both claim 1 and claim 6.

Claims 8-9 and 12

Claims 8-9 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata in view of U.S. Patent No. 5,976,261 to Moleshi et al (hereinafter "Moleshi").

Moleshi discloses a programmable multi-zone showerhead for ultraclean controlled injection of multiple process gases into a fabrication equipment process chamber. Moleshi does not suggest or teach that a diffusion plate having a plurality of nozzles which is in communication with a passage radially formed from the second connection line and extend toward the inner side surface of the reactor block to spray the second reaction gas and the inert gas toward edges of the wafer. Thus, Moleshi does not cure the deficiency of Kawata. Accordingly, the combination of Moleshi and Kawata does not render obvious claim 1. Claims 8, 9 and 12 depend from claim 1, and thus are believed to be allowable for at least the reasons

given for claim 1.

Claims 10 and 15

Claims 10 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Kawata in view of U.S. Patent No. 5,425,812 to Tsutahara et al (hereinafter "Tsutahara").

Tsutahara discloses a reaction chamber for a chemical vapor deposition apparatus for achieving an improved uniform film deposition of high accuracy. Tsutahara does not teach or suggest the second connection line and the nozzles, as cited in claim 1. Thus, Tsutahara does not cure the deficiency of Kawata. Accordingly, the combination of Kawata and Tsutahara does not render obvious claim 1. Claims 10 and 15 depend from claim 1, and thus are believed to be allowable for at least the reasons given for claim 1.

Claim 11

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata and Tsutahara in view of Japanese Patent No. 09-316644 to Arai et al (hereinafter "Arai").

Arai discloses a shower head nozzle of CVD device having a heat exchanging means and having a predetermined thickness to improve a film forming rate without deteriorating a film quality. However, Arai does not teach or suggest that first and second connection lines and a diffusion plate having a plurality of nozzles a plurality of nozzles which is in communication with a passage radially formed from the second connection line and extend toward the inner side surface of the reactor block to spray the second reaction gas and the inert gas toward edges of the wafer. Thus, Arai does not cure the deficiency of Kawata and Tsutahara in individual or combination. Accordingly, the combination of Kawata, Tsutahara and Arai does not render obvious claim 1. Claim 11 depends from claim 1, and is believed to be allowable at least the reasons given for claim 1.

Claim 13

Claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata in view of U.S. Patent No. 5,076,207 to Washitani et al (hereinafter "Washitani").

Washitani discloses an atmospheric CVD apparatus. Washitani does not suggest or teach first and second connection lines and a diffusion plate having a plurality of nozzles which is in communication with a passage radially formed from the second connection line and extend toward the inner side surface of the reactor block to spray the second reaction gas and the inert gas toward edges of the wafer. Thus, Washitani does not cure the deficiency of the Kawata. Accordingly the combination of Kawata and Washitani does not render obvious claim 1. Claim 13 depends from claim 1, and is believed to be allowable for at least the reasons given for claim 1.

Claim 16

Claim 16 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata in view of Arai. As discussed above with respect to the rejection of claim 11, the combination of Kawata and Arai does not render obvious claim 1. Claim 16 depends from claim 1, and is believed to be allowable for at least the reasons given for claim 1.


Conclusion

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims, as amended herein, are now allowable to Applicant. Thus, reconsideration and allowance are respectfully requested.

The Examiner is invited to contact Applicant's attorneys at the below-listed phone number with any questions. If there are any charges due with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant's attorneys.

Respectfully submitted,

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